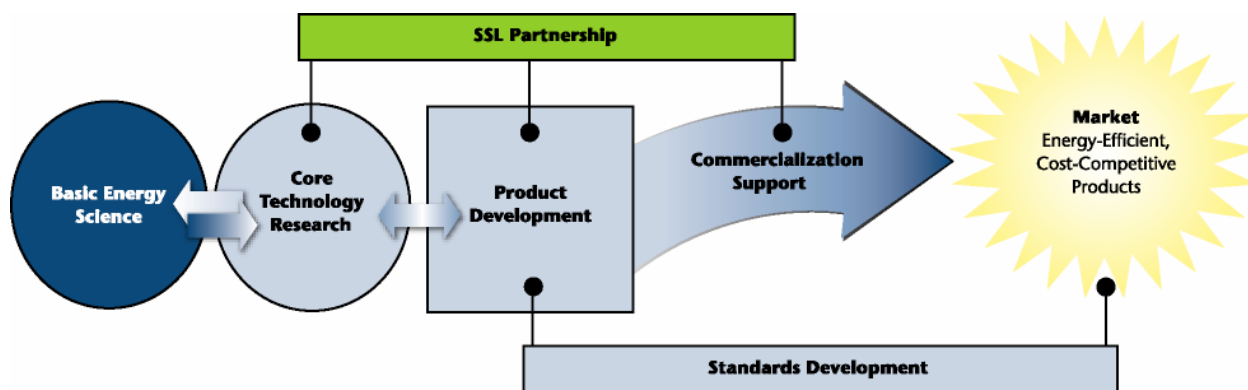


# Guiding Technology Advances from Laboratory to Marketplace

The U.S. Department of Energy's solid-state lighting (SSL) portfolio draws on the Department's long-term relationships with the SSL industry and research community to guide SSL technology from laboratory to marketplace. DOE's comprehensive approach includes Basic Energy Science, Core Technology Research, Product Development, Commercialization Support, Standards Development, and an SSL Partnership.

**Basis Research Advances Fundamental Understanding.** Projects conducted by the Basic Energy Science Program focus on basic scientific questions that underlie DOE mission needs. These projects target principles of physics, chemistry, and the materials sciences, including knowledge of electronic and optical processes that enable development of new synthesis techniques and novel materials.

### DOE SOLID-STATE LIGHTING PORTFOLIO



- DOE's **Basic Energy Science** Program conducts basic research to advance fundamental understanding of materials behavior. Project results often have multiple applications, including SSL.
- **Core Technology Research** projects focus on applied research for technology development, with particular emphasis on meeting efficiency, performance, and cost targets.
- **Product Development** projects focus on using the knowledge gained from basic or applied research to develop or improve commercially viable materials, devices, or systems.
- To ensure that these investments lead to SSL technology commercialization, DOE has drawn on its ongoing relationships with the SSL industry and research community to develop appropriate **Commercialization Support** strategies.
- In addition, DOE is working with the National Electrical Manufacturers Association (NEMA), the Next Generation Lighting Industry Alliance (NGLIA), and other industry and research organizations to begin the **Standards Development** process.
- The **SSL Partnership** provides input to enhance the manufacturing and commercialization focus of DOE's SSL portfolio.



---

**Core Technology Research Fills Knowledge Gaps.** Conducted primarily by academia, national laboratories, and research institutions, Core Technology Research involves scientific research efforts to seek more comprehensive knowledge or understanding about a subject. These projects fill technology gaps, provide enabling knowledge or data, and represent a significant advance in our knowledge base. They focus on applied research for technology development, with particular emphasis on meeting technical targets for performance and cost.

**Product Development Utilizes Knowledge Gains.** Conducted primarily by industry, Product Development is the systematic use of knowledge gained from basic or applied research to develop or improve commercially viable materials, devices, or systems. Technical activities focus on a targeted market application with fully defined price, efficacy, and other performance parameters necessary for success of the proposed product. Project activities range from product concept modeling through development of test models and field-ready prototypes.

**Commercialization Support Activities Facilitate Market Readiness.** To ensure that DOE investments in Core Technology Research and Product Development lead to SSL technology commercialization, DOE has also developed the Federal government commercialization support strategy. Working with the SSL Partnership and other industry and energy organizations, DOE is planning a full range of activities, including:

- ENERGY STAR® designation for SSL technologies and products
- Design competitions for lighting fixtures and systems using SSL
- Coordination with utility promotions and regional energy efficiency programs
- Technology procurement programs that encourage manufacturers to bring high-quality, energy-efficient SSL products to the market, and that link these products to volume buyers
- Consumer and business awareness programs
- Information resources for lighting design professionals and students

**SSL Partnership Provides Manufacturing and Commercialization Focus.** Supporting the DOE SSL portfolio is the SSL Partnership between DOE and the Next Generation Lighting Industry Alliance (NGLIA), an alliance of for-profit lighting manufacturers. DOE's Memorandum of Agreement with NGLIA, signed in 2005, details a strategy to enhance the manufacturing and commercialization focus of the DOE portfolio by utilizing the expertise of this organization of SSL manufacturers.

The SSL Partnership will provide input to shape Core Technology Research priorities, and will accelerate implementation of SSL technologies by:

- Communicating SSL program accomplishments
- Encouraging development of metrics, codes, and standards
- Promoting demonstration of SSL technologies for general lighting applications
- Supporting DOE voluntary market-oriented programs

**Standards Development Enables Meaningful Product Comparisons.** The development of national standards and rating systems for new products enables consumers to compare products made by different manufacturers, since all companies must test their products and apply the rating in the same way. No ratings or standards have been set yet for SSL products, but DOE is working with the National Electrical Manufacturers Association (NEMA), NGLIA, and other industry and research organizations to begin development of needed metrics, codes, and standards.